Chapter 17

Usage of N/A, UNK and NULL

17.1 Interpretation of N/A, UNK, and NULL

During the completion of data product labels or catalog templates, it often occurs that a value is not available for a required data element. The symbolic literals "N/A", "UNK", and "NULL" are used in such cases to represent the fact that no value is available and also to suggest the reason why the value is not available. This chapter provides both descriptive and technical definitions for these symbolic literals.

The symbolic literals "N/A", "UNK", and "NULL" are allowed for use in all domains of all data elements. In the descriptions, the actual use of a data element is referred to as an "instance" of the data element.

17.1.1 N/A

When it appears as a value, "N/A" (shorthand for "Not Applicable") indicates that the values within the domain of this data element are not applicable in this instance.

```
INSTRUMENT_ID = "N/A"
```

For example, in the Data Set catalog object, the instrument identification associated with NAIF SPK kernels is "N/A" since these data sets have no associated instruments.

17.1.2 UNK

When it appears as a value, "UNK" (shorthand for "Unknown") indicates that the value for this data element in this instance is permanently not known. A value is applicable but none is forthcoming.

```
FILTER_NAME = "UNK"
```

In this example for a value with a character data type, the filter used for a Viking Image is not known and no archive exists that supplies this information.

```
TWIST_ANGLE = "UNK"
```

"UNK" can also be used for values that have numeric data types, as shown in this example. Here it indicates that the twist angle that applies to an image is not known and no archive exists that supplies this information.

17.1.3 NULL

When it appears as a value, "NULL" indicates that the value for this data element in this instance is temporarily unknown. A value is applicable and is forthcoming.

```
DATA_SET_RELEASE_DATE     = "NULL"
```

This example shows that a data set could be loaded into the catalog before being officially released. During the interim, the release date is not known.

17.2 Implementation recommendations for N/A, UNK, and NULL

Within information processing systems such as the PDS catalogs, the above definitions imply that three distinct values will be stored for the "figurative constants" N/A, UNK, and NULL. The PDS recommendations are as follows.

1) For character fields: The strings "N/A", "UNK", and "NULL" (see 3) can be stored as values in data elements with character data types. This includes DATE/TIME data types where UTC or other character formats are specified.

2) For numeric fields: See Table 17.1 for the values stored for data elements with numeric data types.

3) Exception: Files such as volume INDEX files that are included in archive volumes in ASCII format may use the figurative constants "N/A", "UNK", and "NULL" for both numeric and character data types. Alternatively, numeric constants representing N/A, UNK, and NULL may be defined for each column in an INDEX table, using the keywords NOT_APPLICABLE_CONSTANT, UNKNOWN_CONSTANT, and NULL_CONSTANT in the appropriate COLUMN objects.

Table 17.1: Numeric values for N/A, UNK, NULL

	Signed Integer (4 byte)	Signed Integer (2 byte)	Unsigned Integer (4 byte)	Unsigned Integer (2 byte)	Tiny Integer (1 byte - unsigned)	Real	Binary Time
N/A	-2147483648	-32768	4294967293	65533	locally defined	-1.E32	Jan. 1, 1753**
UNK	2147483647	32767	4294967294	65534	locally defined	+1.E32	Dec. 31, 9999**
NULL	Null*	Null*	null*	null*	null*	null*	null*

* The availablility of NULL as a universal value across data types in some data management systems simplifies the implementation of the figurative constant "NULL". However, if a system "null" is not available, then either a) an arbitrary value can be chosen, or b) the meanings of UNK and NULL can be combined and the token or numeric representation of UNK used.

** Sybase limits.